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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/700,185	12/18/2000	Takayuki Araki	P06971US00/L	2588

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SUITE 900  
ALEXANDRIA, VA 22314

EXAMINER
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RUTHKOSKY, MARK

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8

<b>Office Action Summary</b>	<b>Application No.</b> 09/700,185	<b>Applicant(s)</b> ARAKI ET AL.	
	<b>Examiner</b> Mark Ruthkosky	<b>Art Unit</b> 1745	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 August 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5-30 and 35-52 is/are pending in the application.
- 4a) Of the above claim(s) 1,5-29,37 and 41-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 30,35,36,38-40 and 45-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The rejection of claims 32-34 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement has been overcome by applicant's cancellation of the claims.

The rejection of claims 32-34 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been overcome by applicant's cancellation of the claims.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

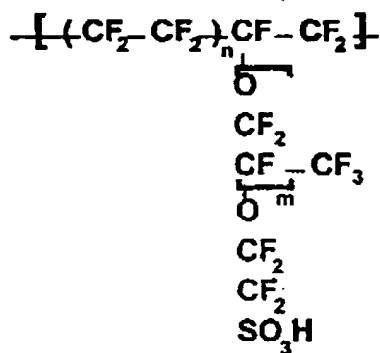
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 30, 35-36 and 38-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Cisar (US 6,492,431.)

Cisar (US 6,492,431) teaches a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of

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fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups.

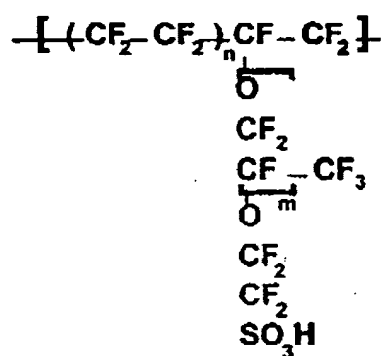


One segment block contains polytetrafluoroethylene groups (PTFE) and another segment block contains perfluorovinyl ester with sulfonic acid functional groups. The crystalline melting point is over 300 C. The perfluorovinyl ester with sulfonic acid functional groups segment includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups. It is further noted that the polymer may include a sulfonyl fluoride group (figure 3 and accompanying text.) The material is commonly known as Nafion, which has an equivalent weight of 400-1600, (see example 2 for a weight of 950.) As the materials of the reference and the instant invention are equivalent, the modulus of elasticity of the materials will be the same. Thus, the claims are anticipated.

Claims 30, 35-36 and 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Cisar (US 5,635,039.)

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Cisar (US 5,635,039) teaches a material for a solid polyelectrolyte, comprising a multi-segmented fluoropolymer that comprises a block copolymer containing at least two types of fluoropolymer chain segments differing in monomer composition, at least one type of the fluoropolymer chain segments containing sulfonic acid functional groups. The material is defined to be Nafion, which has the following structure:



One segment block contains polytetrafluoroethylene groups (PTFE) and another segment block contains perfluorovinyl ester with sulfonic acid functional groups. The crystalline melting point is over 300 C. The perfluorovinyl ester with sulfonic acid functional groups segment includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups. It is further noted that the polymer may include a sulfonyl fluoride group (col. 13, lines 7-17.) The material is commonly known as Nafion, which has an equivalent weight of 400-1600, (see col. 7, lines 45-end for a weight of 1100.) As the materials of the reference and the instant invention are equivalent, the modulus of elasticity of the materials will be the same. Thus, the claims are anticipated.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 45-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cisar (US 6,492,431) OR Cisar (US 5,635,039.)

The teachings of Cisar (US 6,492,431) and Cisar (US 5,635,039) have been presented. The references do not teach molecular weights for segment A and segment B. The references are silent to the molecular weight of the material. The Cisar references, however, disclose materials that comprise segment blocks containing polytetrafluoroethylene groups (PTFE) and perfluorovinyl ester with sulfonic acid functional groups, commonly known as Nafion. The references show that each segment has a function in the copolymer. The Nafion component gives an ion-conducting element to the copolymer and the PTFE component gives a structural reinforcing element to the copolymer (see '431, col. 8, lines 30-44. and col. 7, lines 15-30.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to alter the amount of each material in order to provide a material having a desired size, strength or ionic conductivity depending on the desired application. For example, a fuel cell ion-conducting membrane may require a greater amount of an ion-conducting segment in order to conduct hydrogen. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

***Response to Arguments***

Applicant's arguments filed 8/15/2006 have been fully considered but they are not persuasive.

Rejections based on 35 U.S.C. 102. The applicant argues that segment A is combined with Segment B thus forming a bond between segments. Further, applicant argues that one skilled in the art would recognize that a multi-segmented fluoropolymer would have segments or blocks bonded to one another and that the multi-segmented fluoropolymers taught in the Cisar references are not block copolymers. These arguments are not persuasive.

First, applicant has amended the claims to states that the copolymer contains one or more blocks essentially consisting of segment A and one or more blocks essentially consisting of segment B. Thus, only one combination of segment A and segment B are required. This is clearly met by the reference. It is noted that the segments are bonded together (see figure 1 of '431.) Further the blocks must be bound together in order to polymerize the material. Thus, the reference clearly meets the requirements of applicant's amended claims. One segment block contains polytetrafluoroethylene groups (PTFE) and another segment block contains perfluorovinyl ester with sulfonic acid functional groups. The perfluorovinyl ester with sulfonic acid functional groups segment includes (a) an ethylenic fluoropolymer unit containing sulfonic acid functional groups; and (b) at least one type of ethylenic fluoromonomer unit copolymerizable with the unit (a) and containing no sulfonic acid functional groups.

The reference clearly states that membrane may be blended as well as alternating blocks of each type of segment described. Cisar states that the polymer may include regions of pure PTFE and regions of the proton conductive region having sulfonic acid functional groups (col. 7,

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lines 15-30.) The material is referred to as a polymer block-type as compared with a random polymer. Further, the reference defines the PTFE segment to provide a reinforcing matrix and the proton conductive sulfonic acid region as a high proton conductive region (see '431, col. 7, line 15 to col. 8, line 15.) These regions are equivalent to those in applicant's claimed invention. Thus, Cisar is not silent with regard to a block copolymer. The reference clearly states that the material may be a block copolymer comprising both units of PTFE and a mixed polymer with sulfonic groups included. Thus, the claims stand rejected over the applied references.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

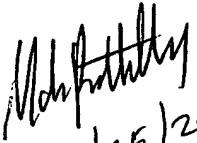


***Examiner Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky  
Primary Patent Examiner  
Art Unit 1745

  
10/25/2006